FACTS

FOR ENVIRONMENTAL STUDIES

Ontario
Ministry
of the
Environment

SET 3E

CLEAN-UP DAY

CITY STREET TREES

CITY PLANNING

THE SCHOOL SITE AS A
TEACHING RESOURCE

THE ENCLOSED MATERIALS
ARE DESIGNED TO BE COPIED.
YOU ARE INVITED TO DO SO.

Educational Resources Co-ordinator
Information Services Branch
Ministry of the Environment
135 St. Clair Avenue West
TORONTO, Ontario
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FACTS FOR ENVIRONMENTAL STUDIES

Ministry of the Environment
Ontario

CLEAN-UP DAY

Purpose of Clean-Up Day

The purpose of Clean-Up Day is to improve the appearance of an area and to encourage its citizens not to litter.

We hope that, by having students clean up the litter in their areas, it will create more enthusiasm for the project, and more public awareness of the problem. The clean-up would also serve as a starting point for a unit dealing with the whole problem of solid waste disposal.

Suggested Organization Procedure

1. The clean-up should be scheduled to take place on a given morning with an alternate date specified in the event of bad weather.

2. Each school is responsible for organizing the clean-up in its own area. Schools should encourage as many parents, older brothers and sisters, etc. as possible to participate.

3. Groups should be formed consisting of no more than 10 students with a leader. Each group could be assigned a section of the school's area.

4. Two sizes of garbage bags have been provided. The smaller bags may be more suitable for younger students. When full the bags should all be piled at a designated point.

5. Old clothes and shoes should be worn. An old pair of gloves in each group would be helpful in picking up broken glass. Rakes or even shovels may be helpful in the clean-up of the school yard.

6. The clean-up should be confined to public property, along sidewalks, parks, etc. Do not pick up material from private property unless asked to do so.

7. Warnings to motorists should be broadcast on the radio prior to the clean-up and the police should be alerted, in order to ensure the safety of the students.

Litter Pick-Up and Disposal

Special garbage pick-ups should be arranged in the afternoon. Please designate a spot to pile the garbage bags which can be easily seen and reached by the trucks.

Designing a Unit Based on Clean-Up Day

Although a spring clean-up does temporarily improve the appearance of our neighborhoods, it does not help to solve the real problem, the problem of the ever-increasing amount of solid waste or garbage we produce and must dispose of.

We suggest that, using Clean-Up Day as a starting point, your class could investigate the problem of garbage, where it comes from, what it is, how we dispose of it, how we can reduce the amount produced. In this way, Clean-Up Day may have a more lasting educational value. Some suggestions are offered below.

Pre-Planning

- discussion of procedures for Clean-Up Day
- review of safety rules
- problems created by litter, i.e. unsightliness, expense of collection

Clean-Up Day

Ask students to observe the type of material they collect, what type is most common, i.e. candy wrappers, pop cans, etc.

Compare the type and amount of litter found around the school, in a residential area.

How much litter did your class collect? Is litter a problem in your neighborhood?

Take before and after pictures of the area you cleaned up.

Follow Up Activities

Take a sample bag of litter. Classify it by type of material, source, etc. (Use rubber gloves!) Use the information to make bar graphs.

Observe other pupils during recess, on their way home from school. Record where any littering occurred, what was littered. Or, select a segment of a street and observe for a definite period every day for a week. Who litters? Did Clean-Up Day teach students not to litter?

How would the type of litter found in the following places differ from the type in the school yard, along a highway, near the corner store, shopping plaza, back-yard, on a farm?

Select one of the more common types of litter, such as a pop can or candy wrapper. Trace its whole life, the materials that went into it, its manufacture and marketing, how we dispose of it.

Conduct a survey of the type and amount of garbage produced by students in the classroom, at home. What goes into "garbage"? Are there things which could be reused or recycled? What does your garbage say about you?

Make a model cubic yard out of cardboard. On garbage collection day, observe the truck and calculate the number of cubic yards it holds. Ask the driver how many trips he makes per day, how many trucks there are. Using this information, calculate the number of cubic yards of garbage collected in the city per day, week or year. Write to the city public works department to see how accurate your estimate is.

Where does the garbage truck take our garbage? Arrange to visit a sanitary landfill site. Investigate the costs of garbage disposal.

Investigate the various methods used to dispose of garbage, i.e. landfill, incineration, recycling, composting. Compare the costs, effects on the environment.

Create your own landfill site, in order to compare the bio-degradability of various materials. Collect four pieces each of newspaper, waxed paper, brown paper, garbage bag, saran wrap, glass, copper, iron, wood, styrofoam, plastic, tin can, nylon, cotton, wool, etc. Place three of each type of material in a flat of garden soil partly buried in rows. Remove one row each week for three weeks, compare with fourth piece which was not buried.

Alternatively, bury small amounts of various materials. Record what was buried, dig it up next year.

What could an archeologist learn about our way of life by excavating one of our garbage dumps a hundred years from now?

Have pupils attempt to burn some of each type of litter. Keep records as to amount of smoke and ash produced, ability of substance to burn or be burned up.

Make new paper out of old. Tear several sheets of used paper into pieces, put in bowl with warm water and 2 tsp. starch. Using egg beater, make a pulp. Dip window screen into bowl, let water drip out. Turn screen upside down on newspapers. Remove screen carefully, allow to dry, remove from newspapers and iron if necessary. Use the paper for your next art project.

Investigate the feasibility of recycling various materials. Are markets available, are people willing to get involved?

Determine the percentage of packaging in a bag of groceries. Was it all necessary?

Survey class members or stores to see which sells more, milk jugs or pouches, refillable or non-refillable pop bottles.

Conduct a survey to determine the availability of refillable pop bottles, compare cost of refillables and non-refillables.

Use objects you would normally throw out in your next art project.

Watch for newspaper articles for your bulletin board.

Make a list of things we could do to reduce the amount of garbage we produce at school, at home.

Write letters to: the city to obtain information about garbage disposal, to your M.P.P. asking that non-returnable bottles be banned, etc.

Resource Material

Audio-Visual

Garbage (color, 10 minutes) available from Marlin Motion Pictures Limited. 47 Lakeshore Road East, Port Credit.

Join the Waste-Watchers slide presentation, available from the Ontario Ministry of the Environment, 135 St. Clair Ave. West, Toronto, Ontario M4V 1P5. Cost $5.

Books, Brochures

Fegley, T. Recycling Rodale Press Inc. Emmaus, Pennsylvania, 1973.

Goldstein, J. Garbage as You Like It Rodale Press, 1969.

Ministry of the Environment. Various publications on solid waste management, including Composting - An Educational Fact Sheet on Recycling Solid Waste, A Visit to a Landfill Site, How to Publicize a Recycling Drive and an Introduction to Solid Waste and Recycling.

Schatz, A. and V. Teaching Science with Garbage, Rodale Press, 1971.

Swatek, Paul The User's Guide To The Protection of the Environment, Ballantine Books, New York, 1970.

Wirnam, R.S. The Yellow Pages of learning Resources, M.I.T. Press, 1972.

Recycling: Identifying the Barriers available from the Garbage Coalition, 43 Queens Park Crescent, Toronto. Cost $1.

Adapted from the Clean-Up Day Manual (May 12, 1976) prepared by the North Bay-Mattawa Conservation Authority, P.O. Box 1215, Shebrooke Street, North Bay, Ontario P1B 8K9

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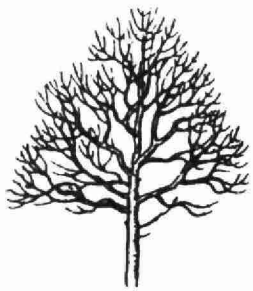


CITY STREET TREES

Cities are brick, stone and concrete; they can also be places of green. Street trees provide much of this green, and they have an enormously beneficial effect on city life. The beauty they give is an asset to any area, whether they are in orderly rows along well-tended blocks or growing sparsely in neglected neighborhoods.

Trees are essential to a good total environment in many ways. Some of these are:

1. They are nature's air conditioners, cooling the air beneath their branches by shading and by transpiration of water from their leaves. The temperature under a tree on a hot day can be 8-10 degrees cooler than in the sun. One mature tree can evaporate 300 gallons of moisture per day. Large trees can buffer winter's fierce winds, thus providing some shelter for buildings.

2. They absorb some city noise, especially that of the automobile and truck.

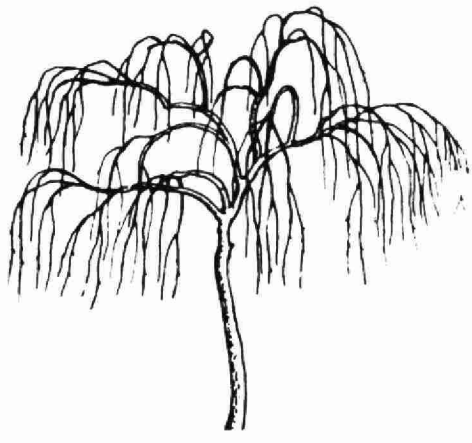
3. Their hairy leaf surfaces trap and filter out dust and pollen particles in the air.

4. They absorb carbon dioxide and provide much of the oxygen necessary to maintain life for animals and man.

5. They help the soil to retain and absorb moisture by breaking up pelting raindrops before they hit the soil and run off. In addition, their fallen leaves decay into a mulch which further enriches the soil and helps it to retain water and nutrients.

6. They provide food and shelter for wildlife.

City street trees have proven themselves to be very tough. They are attacked in many ways and their living environment is definitely not a favorable one. Air pollution from cars and other sources can harm the leaves, causing their main functions to be impaired. They can become dehydrated in periods of drought and also when the dirt becomes so tightly packed around their roots that no water can percolate into the soil. Tall buildings can block sunlight, causing them to grow crookedly in an effort to find more light. Roots are damaged when the salt that is used to melt ice on the sidewalks is washed into the soil around



the tree. Dogs use the trees as bathrooms, which injures the bark and can saturate the ground with poisons. Careless people add to the tree's woes by carving on the bark, putting sharp objects into it, or even stripping it completely off. It is little wonder that after all this, city trees have an extra hard time combating tree diseases.

Since their environment is so unfavorable, street trees need all the help we can give them. Both adults and children can help the trees to grow well and remain strong by:

1. Loosening the soil around trees when it becomes packed down.

2. Watering trees with 6-8 pails of water twice a week in dry periods. A better method of watering is to put a gently-running hose in the tree pit for half an hour to an hour.

3. Protecting trees from dogs by strong tree guards around the pit. This also helps protect trees from cars which can damage them while trying to park.

4. Trying to prevent people from mutilating and scarring trees by a program of neighborhood education.

5. Reporting dead trees and those which need pruning to the Department of Parks.

6. Planting new trees to supplement or replace the old ones at the fall and spring planting times.

7. Using sand or calcium chloride instead of salt for de-icing sidewalks.

8. Adopting a tree near your home or school and taking care of it.

By careful observation and correct techniques, the average citizen can be of great benefit to the city by helping to care for neighborhood street trees.

This fact sheet was taken from the teaching unit "Green Spaces in City Places" prepared by the Environmental Action Coalition. For a series of lesson plans on caring for city trees write to the Environmental Action Coalition, 156 Fifth Ave., Suite 1130, New York, N.Y. 10010.

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CITY PLANNING

Do you take walks through your neighborhood? Do you look at what's there? If you do, you'll see many things that are part of your city environment. Trees, parks and open places. Houses, schools and stores. Sidewalks, factories and office buildings. And, maybe, trolley tracks or railway lines.

But have you ever thought about what you are really walking on? The streets and sidewalks cover it. Houses are built on it. Trees grow out of it. It is the land.

Land makes up only one-fourth of our earth's surface. This small amount of land is important because we need to use it in so many ways. In fact, land can be so important that people fight wars over it!

The ways that we use land affect our environment and our lives. These ways are known as land-use. But we've never thought much about how or why we use land. Most city land-use has been left to chance. Now some people called planners are looking at the ways we use land. They are thinking about whether our land-use is good or bad. Some planners say that we have wasted land in the past. They say that city land can be used more wisely for a better environment.

Students can learn about land-use, too. You can think and plan for a better future. These projects will help you to become a good planner.

Be a Looker

How do you find out how land is being used now? You have to look! And you have to choose the place to look.

A. First, decide how big your place will be. This will become your study area. You may use your whole neighborhood, if it is a small one. Or, you may choose an area near your school. Either way, it should be a total of about ten blocks. After you have chosen your study area, find its boundaries. Boundaries are the outside edges of a particular place. Most of the time, boundaries will be streets. But they may also be railroad tracks, rivers, parks or expressways.

B. Next, gather some data. Your data will be information about what you see when you look at your study area. You want to know how land is used now. Use the following questions as your guide:

1. Are there rivers or other streams in the area?
2. How many parks are in your study area? How many acres do they cover? (Ask the Parks Department at your local Municipal office.)
3. Is there any vacant land that is not being used? Is it in one big plot? Or is it in small, scattered lots?
4. Are there tree-lined streets in the study area? Which blocks have the most trees? Which have the least trees?
5. How many blocks have some kind of housing for people? How many blocks have big apartment buildings? How many have smaller houses?
6. Where are the stores? Is there a large shopping centre? Are there small stores along one street? Are there stores on the corners of the housing blocks?
7. Does your study area have schools, hospitals, fire houses, or libraries? Are they close to the blocks that have housing?
8. Are there railroad tracks in the area? Do they form a boundary? Or do they split the neighborhood in two?
9. Are there expressways in the area? Do they pass through the housing blocks?

You may want to ask more questions of your own. There are always new things to learn when you are a looker!

C. Make a map of your study area. Draw the boundaries and put in the railways, the expressways, parks, and special buildings such as schools. Write in their names.

Be a Thinker

Now think about why the land in your study area has been used in its many different ways. Try to decide whether these uses have been good or bad for people and their environment. Planners call this evaluation.

Here are some things to consider:
- housing
- jobs
- transportation
- open spaces

Has your study area provided for these?

Be a Planner

Now design your own city. Make sure there is enough space for houses, apartments, office buildings, factories, schools and libraries, transportation routes and parklands.

This fact sheet was adapted from the March/April, 1976 issue of Eco-News, an environmental newsletter for young people. To obtain a copy of the illustrated issue and teaching guide, send 60¢ to the Environmental Action Coalition, 156 Fifth Avenue, Suite 1130, New York, N.Y. 10010.

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THE SCHOOLSITE AS A TEACHING RESOURCE

It is not necessary to have elaborate facilities to learn in the out-of-doors. The schoolgrounds and the neighborhood of the school are rich teaching situations. When teachers see the schoolsite as an inexpensive teaching aid, the variety of learning experiences is only limited by the ingenuity of the teacher.

An outdoor experience should have a definite relationship to the regular school curriculum if it is to find acceptance on the part of parents and educators.

A thorough examination of the curriculum must be made and those concepts which can be developed more effectively in the natural environment of the schoolgrounds should be taught there. Those concepts which can best be assimilated indoors, however, should then be taught in the classroom.

The schoolsite is an excellent laboratory for learning because it is always available and the teacher and the class can move in or out whenever it is feasible and right to do so.

The following is to demonstrate the possibilities offered by an average, apparently barren, schoolground:

A. Language Arts:

The informality of an outdoor setting provides an atmosphere where even the shiest students are likely to participate in activities involving language. Also, young people with a small vocabulary are apt to meet situations and experiences where they can communicate with their fellow students and the teacher.

1. Practice listening, with eyes closed, counting the number of different sounds heard.
2. Listening and describing several types of sound heard outdoors.
3. Using the outdoor setting for a story of pioneering, travel or nature study. Teachers will find that the schoolgrounds provide a different mood than the classroom, where walls and ceiling may form a barrier to the imagination.
4. Listening and classifying descriptive words, such as the feel of the bark of four different trees.
5. Listening and using adjectives of objects seen, heard or felt.

6. Identifying and observing animal homes to be used in story-writing. Earthworm, mouse, bird's nest, spider web, anthill, groundhog burrow, etc.
7. Keeping a daily log, describing the growth of a plant or a tree, the organisms in a crack in the pavement or the types and numbers of birds seen.
8. Creative writing of tall stories or imaginary adventures.
9. Dramatization: the activities of living organisms can be dramatized in plays or skits.
10. Making labels for a nature trail around the school or a nearby park.
11. Producing a trail guide for same.

B. Mathematics and Measurement:

1. Number and size concepts can be developed on the playground; the arranging of ten leaves in order of size, the picking up of fourteen pebbles, taking three steps forward and then to the right etc.
2. Mathematical word meanings; the roof of the school is high, the birds fly higher, but the clouds are highest. Similar examples can be found for small, far, near, more than, less than, heavy and light concepts.
3. Set theory and number facts. The collection of sets and subsets of rocks, leaves, pebbles, trees and shrubs.
4. Using "personal" standards of measurements to estimate distances, such as the length of an arm, the length of a pace, the handspan.
5. Comparing the weights of different kinds of rocks of the same size. Volume and density measurements.
6. Measuring areas and perimeters. Using nylon ropes and steel pegs to set out squares, rectangles and triangles.
7. Learning to use a compass and find the compass directions.
8. Estimating elapsed time between leaving the building and reaching a certain point on the schoolgrounds.
9. Taking a tree census -- counting all trees of each variety, set theory.
10. Estimating heights.

One student of known height, say 1.5 metre, stands at the foot of a tall object to be measured. Other students move back about 25 metres and hold a tall stick vertically at arm's length in front of themselves. The thumbs are then used to mark off on the stick what appears to be the height of the tall object, each student can then estimate the height of the object to be measured.

C. Science:

1. Animal Habitats. Animal homes found in and around most schoolgrounds are those of ants, mice, moths, butterflies, squirrels, and birds. Students will soon discover tracks in mud or snow when walking around the buildings. The natural environments of many plants eaten by animals, such as grass, bushes and trees can also be discussed.

2. Air. What is wind? The principle of flight, observing aircraft and birds, flying kites of different models. The principle of the parachute.
Air pollution: clean a sill one day and check 24 hrs. later with a kleenex.
Cloud identification.
The water cycle: cover a small puddle with a sheet of plastic, observe condensation taking place, deduce evaporation.

3. Soil and Rocks. Dig a small hole and observe the difference between topsoil and subsoil. Sample and study indoors for particle size, composition and living organisms. Fertilization experiment on lawn and in flowerbeds. Rocks as soil origins. Weathering processes. Soil type. Soil colors. Rock identifications: a small rockery should be established on the schoolground.

4. Water. Clouds and cloud types. Freezing and expansion can be demonstrated with a filled and closed jar in the wintertime. Evaporation and condensation can be shown with a glass plate or an inverted jar on the lawn on a sunny day. The water cycle. Water pollution can easily be shown with soil, filterpaper and funnel and a glass jar. Water erosion can usually be seen after a rain. Water sources of Ontario cities and towns.

5. Light. Grow some plants or start some seeds on the south and on the north side of the school. The use of a magnifying glass in concentrating sunrays. Shadows cast by clouds and trees. Observe grass growing in dense shade, or under a board or a piece of plastic.
Where around the school does the snow melt last?

6. Weather. It is interesting to keep a one-year record of the temperature at say, 9 a.m. on four sides of the school building. The findings can be tabulated and graphed and conclusions can be drawn. The same can be done for soil temp. Effect of cloud cover and temperatures. The seasons and the changes they bring. An improvised rain gauge will give the student an indication of how much rain falls during a rainstorm or in one day in spring, summer, fall and winter. Cloud identification and movement.

7. Plants. Plant and tree identification. Plants vary greatly in size, shape of leaves, leaf color. Seed dispersal. Types of flowers, root. Students should be encouraged to plant bulbs in the fall and seed some annuals and biennials in the spring. Sexual and asexual methods of reproduction. Plant adaptation, to soil type, light intensity, moisture, content of soil, temp. Seasonal changes in plants and trees. The difference between grasses (monocotyledonous plants) and the broadleaved plants (dicotyledons).

8. Seeds. Seedgermination experiments are worthwhile in the spring. Seed dispersal by means of wind, water, birds, mammals. Seeds as human foods.

9. Birds. Provide nesting and feeding areas to attract birds. Bird identification, keeping a record of daily observations. Flight studies. Bird migration and reasons for these migrations. The basic requirements such as food, shelter, protection and training.

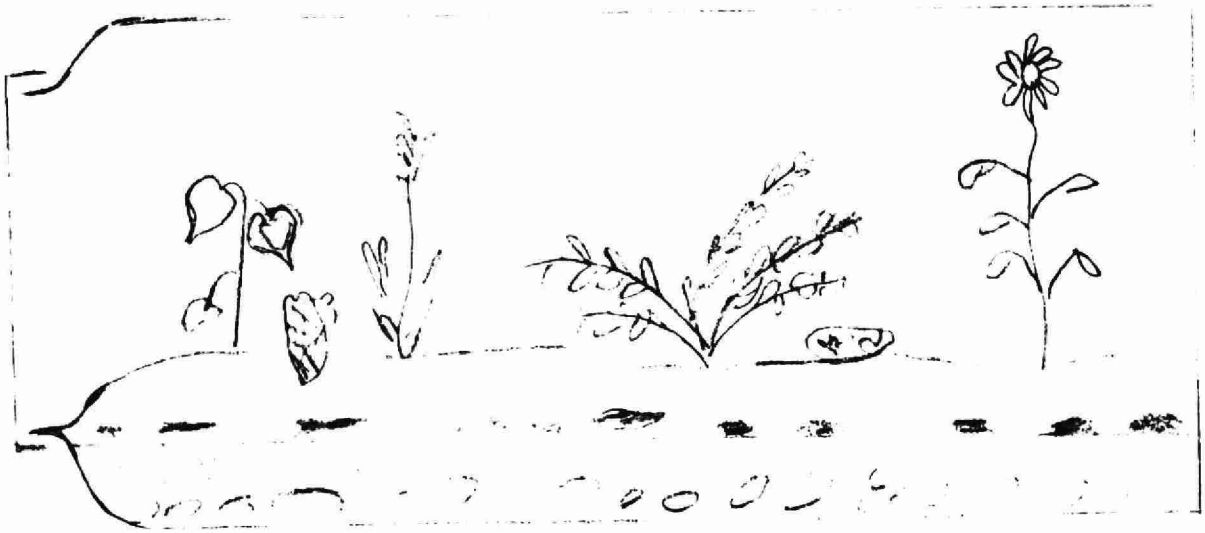
10. Insects. Their role in nature as scavengers, saprophytes and parasites. With a string, mark off a square foot of soil in different areas. Count and compare the number of insects. Watch for differences and similarities. Find insects under logs and rocks, in tree bark, under window sills, etc. Why do they live under and in these places?
Observe plant galls and the insects that produce them.
Find a spider and compare it to an insect.
How do insects produce sound, how do they breathe, how do they reproduce?
Insects seen as man's greatest competitor for food.

11. Fungi. Their role in nature. Find moulds, fungi such as toadstools on lawns and on logs. Place some small logs or pieces of 2 by 4's under the evergreen foundations planting and observe them from time to time. Inform the caretakers of the experiment. The cyclic use of nature's materials aided by fungi.
Differences between green plants and fungi.
The habitats of non-chlorophyll-bearing plants.

12. The Lawns of our schools are annually sprayed with 2.4 D, a weedkiller.
What would our lawns look like if:
    a. they were cut but not sprayed with 2.4 D;
    b. they were neither sprayed nor cut for 6 years, 15 years, 25 years. (succession).

13. An interesting experiment can be conducted by exchanging a 30 cm square section of sod from a shady area with a piece of the same size from a sunny area. Make and observe. Make observations and keep a record of the changes.

14. Making a plant community in the form of a terrarium.
Take a large jar and place it on its side (several jars would be preferable). First, put in a layer of small stones, then a layer of sand and finally some topsoil with a bit of charcoal. Now plant some vegetation. Include some mosses. Then add a quarter to one-half of a cup of water, but no more. Add a snail and some insects. Either keep the lid on or cover the end with a piece of plastic. Add some water when necessary.



15. Gravity. To demonstrate the concept that it takes more energy to move heavier objects than lighter ones, students can be lined up and be given an opportunity to throw objects of different weight. Applications: medieval catapults, rocket launching, ball games.
Gravitational pull is a force and may be overcome by stronger forces is a concept which can be demonstrated by having students rotate a bucket or can half-filled with water without spilling.

16. Biology. By having students observe a grassplant, a tree, an insect or mammal and asking the questions:
i. Observe and describe the environment in which the organism lives.
ii. What does this plant (animal) need for food? and
iii. What will eat this plant or animal?
the following concepts can be developed:

i. food chain
ii. food web
iii. inter-relationships in nature
iv. food cycles of oxygen, carbon, water
v. succession
vi. conservation of soil, air and water
vii. biotic communities
viii. energy flows in nature
ix. soil formation
x. the importance of soils
xi. air and air pollution
xii. water and water pollution
xiii. plant and animal adaptations to their environment.

D. Social Studies:

a. Mapping an Area.
Soon after the students have begun to study maps, let each one work outdoors, make a sketch of the school grounds or a section of a park to see what ideas about maps have been acquired. Are the directions correct? Are the main features of the area shown? Is there a need for clarifying ideas and improving skills? Compasses and rulers or tapes could be used.

b. Map Use Practice.
Have small maps of the schoolgrounds, a city park or other area xeroxed and have students follow a certain course and add significant features to their maps.

c. Geographical Terms.
Terms such as peninsulas, capes, bays and drainage have only an abstract meaning unless the students are given an opportunity to explore along streams or a lake and discover the miniature equivalents of these formations.

d. The Settlement of Essex County.
The physical confinement of a classroom seriously limits the power of imagination of many youngsters. It may be easier for them to realize the difficulties of the settlers around 1800 when they are in a city park or still better, a woodlot or a reforestation area. Concepts such as the building of log houses, the obtaining of fuel and food supplies for winter and transportation without roads and often without wheels can undoubtedly be better developed in the outdoors.

e. Economics and Natural Resources.
Have students discuss the objects seen in the park (tel. poles, trees, topsoil, grasses, water, swings, concrete benches, buildings). What raw materials were required to grow or manufacture these objects? What are their values to society?

Students will soon discover that all these objects have created employment in a variety of industries, including the transportation industry, the building trades, food industry, etc. The origin and uses of soils for man's survival should be discussed.

E. Art:

1. Finding Designs in Nature.
Students enjoy discovering egg shapes, heart shapes, circles, triangles, rectangles, wavy irregular lines and other design in clouds, textures of leaves and bark and in the arrangement of flower parts.
2. Studying colors and shades of colors in tree leaves, grasses, mosses, clouds, bark and fruits.
3. Sketching of perspective, charcoal drawings of plants, trees and clouds.
4. Making of seed, sand or pebble pictures or mosaics.
example: a star design in light and dark stones.
5. The collecting of spider webs.
6. The making of plaster casts of animal tracks.
7. The making of spore prints, blueprints, table decorations, collages and murals based on the natural landscape.
8. The making of Trail Labels for a nature trail around the schoolground.

References:

High School Biology, BSCS Green Version, Rand McNally and Company.
Biological Science, An Inquiry into Life, BSCS Yellow Version, Harcourt Brace and World, Inc., New York.
Adaptation, by Wallace and SRB, Foundations of Modern Biology Series, Prentice Hall.
Animals in Schools by J.P. Volrath, John Murray Publishers Ltd.
Ontario Birds by L. L. Snyder, Clarke, Irwin and Company, Toronto.
Curriculum Enrichment Outdoors by Hug and Wilson, Harper and Row Publishers, (available from Copp Clarke).
A Guide to Field Biology by John Sankey, Longmans.
Weather by Lehr, Burnett and Zim, Golden Press, New York.
Mammals by Zim and Hoffmeister, "
Flowers by Zim and Martin, "
Insects by Zim and Cottain, "
Fossils by Rhodes, Zim and Shaffer, "

Birds by Zim and Gabrielson, Golden Press, New York.
Reptiles and Amphibians by Zim and Smith "
Rocks and Minerals by Zim and Shaffer "
Non-Flowering Plants by Shuttleworth & Zim "
A Leader's Guide to Nature-Oriented Activities, by VanderSmissen and Goering, Iowa State University Press, Ames, Iowa.
The Balance of Nature by L. and M. Milne, Alfred Knopf, New York.

AWARENESS

There are many natural environments: school yard, front lawn, nearby park, woods, fields and stream. Each affords an opportunity to enlarge one's world through expanding awareness. How do we develop a sensitivity to what is around us, that is the question. Here are some things to try with your pupils.

A Listening Moment

Have your group stand quietly with eyes closed for several minutes turning in on the sounds around them. Then discuss what they've heard. Are the sounds man-made or natural? How do the sounds vary in pitch and intensity? Are there discernible patterns? Does the quality of sound differ on a rainy, overcast, day as compared to a clear, dry, day? Over how great a distance did the sounds that were heard carry? What are some of the sources of sound?

Sounds can be described in writing. Sounds can be contrasted, i.e., with sounds as compared to running water sounds. Bird songs can be recorded, diagrammed, and associated with the song-maker.

A Square Food Field Study

One really doesn't have to roam far afield into vast stretches of wilderness to explore the unknown. A square foot of backyard, or leaf strewn lawn, or city park can provide enough discoveries to keep one busy for quite some time.

Observations can be made of the number of different objects within the foot square territory. Which would be classified as plant, mineral, animal? Is there evidence that some materials have undergone change? Is there evidence of birth and growth; death and decay? Is there evidence of man? Which materials might be useful to animals? To man? Which materials or objects can be named? Which objects or phenomena lend themselves to further investigation?

A Trip From Mars

Pretend that you have just arrived from planet Mars by rocket ship. You are now standing on a planet that is completely foreign to you. You are gazing at things for the first time. Select an object: tree, rock, flower... Describe your discovery without using terminology which ordinarily would apply. Words such as: trunk, bark, leaves, twigs, buds, petal, blossom, fracture, luster may not be used. This can pose an interesting challenge to use descriptive language other than the terms with which we are so familiar.

These are but a few techniques and procedures which lend themselves to teaching in the out-of-doors. The result can contribute to the development of more alert, more sharply attuned individuals to the sights and sounds of both familiar and unfamiliar environments.

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